

The Methamphetamine Home: Psychological Impact on Preschoolers in Rural Tennessee

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ABSTRACT: *Context:* A growing number of children reside with methamphetamine-abusing parents in homes where the illicit drug is produced. Yet, the effects of a methamphetamine environment on psychological child outcome are still unknown. *Purpose:* To examine whether preschoolers who lived in methamphetamine-producing homes are at increased risk for developing psychological problems. *Methods:* The participants were 58 white children between the ages of 4 and 5 years; 31 with a history of living in methamphetamine-producing homes and 27 children who live in non-methamphetamine producing homes in rural Tennessee. The groups were similar in age, gender, and socioeconomic background. The groups were compared for behavioral and emotional adjustment using the behavior assessment system for children-parent rating scale-preschool (BASC-PRS-P) form. Biological or custodian parents completed a rating on their preschoolers that provided information about the children's pattern of behavior and feelings. *Findings:* Preschoolers from the methamphetamine-producing homes showed more externalizing problems than their peers, but were comparable on internalizing problems. On specific behaviors, the data indicate that preschoolers in the methamphetamine group showed higher aggression symptoms than their peers from non-methamphetamine-producing homes. *Conclusions:* These findings, if replicated, point to the need for mental health screening when a child is removed from a methamphetamine-producing home.

A large number of children live with parents who abuse illicit drugs.¹ According to the National Center on Substance Abuse and Child Welfare,² 10% of homes where methamphetamine (meth) is produced (meth-lab homes) have children living in them. While there are ample data showing that children who are raised by drug-abusing parents are at risk for a number of developmental problems,^{3,4} little is known specifically about the effect of living in a methamphetamine-producing home on the mental health of children. Only 3 published studies have

examined the effect of meth environment on child outcome.^{5,6,9} For the purpose of this study, a methamphetamine-producing home is defined as a residence in which parent meth abusers (father only, mother only, or both parents) produce the drug for consumption and/or sale. The methamphetamine-producing home provides a unique set of behavioral and emotional issues that are relevant to child outcome, and these warrant investigation.

In the first of 3 published studies on meth environment and child psychological welfare, Haight and research colleagues⁵ conducted a qualitative study that examined the impact of parent meth abuse and the meth environment on the mental health functioning of school-age children. As part of a larger ethnographic study, the researchers interviewed adult informants from 7 rural counties in the Midwest. Eighteen child protective services workers, 7 foster parents, 6 counselors, a law enforcement officer, an elementary school principal, and a state's attorney, all of whom had regular contact with families involved with meth, described their experiences. The informants reported that the children's experiences include environmental danger, neglect, abuse, older children becoming surrogate caregivers for younger siblings, and parents teaching children criminal behaviors such as stealing

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meth ingredients from stores and standing as armed guards looking out for police. They further described the children as displaying significant symptoms of trauma, antisocial beliefs, distrust for law enforcement officers, and academic difficulties. In addition, the informants reported that some of the children actively resisted foster parents' care. Haight and colleagues concluded that these children are at high risk for substance abuse and mental health problems and they emphasized a need for effective mental health services for this population.

Reporting on the same sample, Ostler and research colleagues⁶ used a mixed-methods design that allowed 23 rural school-age children to describe what it was like living with meth-abusing parents. The children, who were between the ages of 7 and 14 were involved with a state child protective agency because they were considered to be at risk for harm due to parental meth abuse and other criminal activities. At the time of the study, 8 children were living with non-substance-abusing families and 15 were living with foster parents. The research team utilized data from local case records to provide information about the children's family experiences. They also conducted semi-structured interviews that allowed the children to describe experiences with their families of origin. In addition, the researchers administered 2 standardized instruments: the Child Behavior Checklist (CBCL)⁷ and Trauma Symptoms Checklist (TSCC)⁸ to assess the children's mental health symptoms. Ostler and colleagues reported that 65% of the children had significant post-traumatic or dissociative symptoms, 48% had scores in the clinical or borderline range for externalizing problems, and 35% for internalizing problems. On specific behaviors, 43% evidenced clinically elevated scores in Aggressive Behavior and Thought Problems and 35% in Attention Problems and Rule Breaking. Their findings also reflected gender differences, with females scoring higher on dissociation and the total CBCL scores. In addition, the children reported inadequate social services and some children used avoidant coping strategies to deal with emotional pain from their home life situations. Ostler and colleagues added that these children under-reported on mental health assessment and some relative caregivers were reluctant to admit to problems with the children in their care.

Haight and colleagues,⁹ drawing on a sample from the larger ethnographic study mentioned above, conducted open-ended, in-depth interviews with 18 children ages 7 to 14. The individually audio-taped interviews presented "the voices of the children" and lasted for about 30 minutes. The children were in the custody of child protective services because of parental

meth abuse between April 2004 and August 2005. Fourteen children had been in foster care for an average of 15½ months, and 4 children were with non-substance-abusing relatives. Fifteen children had a history of living in meth-lab homes, and at the time of the study, their parents were incarcerated for meth-related illegal activities. Haight and colleagues asked the children to describe a "sad or scary time." The researchers reported that a majority of the children were distressed by law enforcement and child welfare interventions and they (children) described their experiences with both agencies. The researchers added that many of the children were already socialized into the rural meth culture, with extensive traumatic histories. They recommended a school-based substance abuse program for the children. While Haight and research team provided the first data on mental health functioning of children with meth-involved parents, their participants were primarily school-aged children who were in foster care. In contrast, the present study focuses on preschoolers from meth-lab homes who were placed with relatives. This study also includes a community comparison group.

Although information is beginning to emerge on mental health outcomes for children living in meth-lab homes, there is a good deal of evidence suggesting that such homes are quite chaotic. Chronic meth abuse has been linked to psychotic behaviors such as intense paranoia, delusions and hallucinations.^{10,11} Chronic meth abuse has also been linked to extreme violence.¹²

The "tweaking cycle" when meth users experience feelings of emptiness and sadness is considered the most dangerous because of the potential for unpredictable violent behavior.¹² These children may be at higher risk for behavior problems because they may increasingly be exposed to the violence that is often associated with illegal drug activities.¹³

The literature on children who lived in homes in which their parents engaged in other illicit (cocaine, heroin, and other opiates) drug use and drug activities suggests that these children are at risk for both externalizing and internalizing disorders.^{3,4} For example, Berger and Osborne³ conducted a study on a sample of 3-year-olds (n = 3,031) from a large cohort, the Fragile Families Study, to investigate associations between parental substance abuse and child behavior. The mothers completed a 36-month in-home assessment. The researchers focused on 5 child behavior problems using the Child Behavior Checklist (CBCL).¹⁴ They reported that parental substance abuse is associated with increased child aggression, attention deficit hyperactivity disorder, and oppositional defiant disorder.

In terms of emotional vulnerability, parental substance abuse may put a child at risk for stress and other emotional disorders.^{6,9,15} In a large-scale study of 283 older children (ages 6-17), Nunes and research colleagues¹⁵ examined the prevalence of psychiatric disorders in children of opiate-dependent parents receiving treatment in methadone maintenance clinics. The researchers found that 24% of the children had anxiety disorders and 21% had depression.

Given the limited research that has been conducted on children from meth-lab homes, the goal of the current study is to evaluate both the externalizing and internalizing behavior problems of young children (ages 4-5) who had been removed from methamphetamine-producing homes. The basic research question that guides this study is: Do preschoolers from methamphetamine-producing homes show clinically significant mental health problems? The research team chose to assess preschoolers because available research on mental health functioning of children from meth-abusing families focuses on school-aged children.^{5,6,9} Developmentally, preschoolers are more vulnerable than their older siblings because they are more dependent on their parents. Older children leave home for school, but younger children are in the home for longer amounts of time and may be subjected to more frequent hazards associated with parental meth abuse and production. In addition, mental health problems at this age, particularly aggression, highly predict subsequent behaviors.¹⁶ Given their greater vulnerability, information on this group is urgently needed. The researchers used the Behavioral Assessment System for Children-Parent Rating Scale-Preschool (BASC-PRS-P)¹⁷ to evaluate the children. Based on research on illicit drug environment and child outcome, the researchers hypothesized that children from methamphetamine-producing homes would have higher rates of both externalizing and internalizing problems in comparison to their community control peers from non-methamphetamine-producing homes.

Methodology

Participants. Participants in this study were recruited from a community-based child intervention program in a rural area of Tennessee. The goal of the program is to prevent school dropouts by providing services to children at-risk due to poverty, unstable family situations, and parental meth production. All participants qualify for school lunch services, an indication of low socioeconomic status (SES). The program provided home visitation, after-school

tutoring, and case management services to children in pre-K to sixth grades. Referrals to the program were usually from the school and the county health department. Children recruited for the study were mostly referred to the community-based program for family issues such as poverty and parental history of meth production. Of the 81 children in the pool, 58 (72%) met the eligibility criteria. The parents (biological/caregivers) of these (58) children were approached and all of them agreed to participate. Thirty-one (53.4%) of the participants were classified in the methamphetamine-producing home group and 27 (46.6%) were in the non-methamphetamine-producing home group. Thirty-one (53.4%) were male and 27 (46.6%) female, 30 (51.7%) were 4 years old and 28 (48.3%) were 5 years old.

Based upon a review of each child's chart by the director of the program, children were assigned to one of 2 groups: methamphetamine home or non-methamphetamine-producing home. The inclusion criteria for the methamphetamine group was as follows: (1) the child had a history of being removed from a meth-lab home, (2) the removal from the home took place at least 3 months prior to the study, (3) the child was currently living with a family member and not with a foster parent, (4) the child did not have known major medical illness, and (5) the child did not have a history of prenatal exposure to meth. For the non-methamphetamine-producing home group, the child must have met all the inclusion criteria but, with no known history of living with meth-abusing parents in a meth-lab home. The demographic descriptors of the children and their parents are presented in Table 1. An important distinction between the 2 groups is that all the children in the methamphetamine group had been removed from their parents' home and were

Table 1. Demographic Descriptors of Preschoolers and Raters by Group (Meth-Producing Homes vs Non-Meth Producing Homes)

Demographic Variables	Meth	Non-Meth
Participants	31 (53.4%)	27 (46.6%)
Children's mean age	4.53	4.59
4-year old	14 (46.6%)	16 (53.4%)
5-year old	16 (57%)	12 (43%)
Female	12 (38.7%)	15 (55.6%)
Male	19 (61.3%)	12 (44.4%)
Rater-biological mother	0 (0%)	27 (100%)
Rater-grandmother	25 (80.64%)	0 (0%)
Rater-aunt	6 (19.36%)	0 (0%)

placed with relatives (grandparents, aunts, and uncles) by child protective services. On the other hand, all participants in the non-methamphetamine-producing group lived with their parents. Thus, in this study a history of living in a meth-lab home is confounded with children being removed from the home. This issue is further discussed under the discussion and limitations sections of this paper.

Study Site. The participants for this study came from one of the 12 geographically isolated rural counties located along the Cumberland Plateau and the Eastern Highland Rim in Tennessee. The Cumberland Plateau is the southern part of the Appalachian Plateau. This county is located in the mid region of the state between Nashville (the state capital) and Knoxville (a university town). The county is located outside the urbanized area and is non-metropolitan. According to the US Census data,¹⁸ the county had a 2006 estimated population of about 52,000 residents who are 98% white. In terms of economic conditions, the Census data indicate that the 2004 household median income was about \$34,000 while the state average was almost \$39,000. The data from the 2004 to 2005 Tennessee Department of Education Report Card¹⁹ indicate that about 58% of the children in the county school system were economically disadvantaged, with over 50% qualifying for free and reduced-price meal programs. The rural study area's demographics are fairly representative of the other rural counties with significant meth problems in the region.

Assessment Instrument. The BASC-PRS-P is a widely used and validated instrument for clinical and research applications with children. The preschool form is a 131-item questionnaire that asks parents to assess a broad range of behavioral and emotional adjustment of children between ages 2½-5 years. Sample items include: "Is easily distracted," "Cries easily," "Cannot wait to take turns," and "Worries." Each parent rates the behavior of the focal child on a 4-point response format: "Never occurs," "Sometimes occurs," "Often occurs," or "Always occurs." The test produces four broad domain scores—Externalizing Problems (EP), Internalizing Problems (IP), Behavioral Symptoms Index (BSI), and Adaptive Skills (AS)—that are computed from 8 relevant clinical scales (hyperactivity, aggression, anxiety, depression, somatization, atypicality, withdrawal, attention problems) and 2 adaptive scales (Adaptability, Social Skills). BASC-PRS-P results are reported as standardized "T-scores" (M = 50, SD = 10). For maladaptive behaviors, T-scores greater than 70 fall in the clinical range and signify problems that require attention, and

T-scores of 60 or more fall in the at-risk range. For adaptive behaviors, T-scores that are 40 or less fall in the at-risk range. BASC-PRS-P scales show adequate reliability. Spies and Jones²⁰ report the internal consistency for the composite scales of the BASC-PRS-P to be between 0.79 and 0.94. The scales also correlate fairly highly (0.70s) with corresponding scales on the CBCL.¹⁴

Procedure. The director of the community program reviewed the records of all 4- and 5-year-olds participating in the program to determine their eligibility for the study. The director asked the families if they would like to participate in a study and if the principal investigator could contact them to explain the study. Subsequently, the principal investigator approached mothers and grandmothers and aunts who agreed to be contacted and the purpose and scope of the study was explained. Those who volunteered to participate completed the informed consent forms. Demographic information such as: name, age, gender, and other data (coded as meth home status) were collected on the BASC-PRS-P forms. The program director, a licensed professional counselor, administered the BASC-PRS-P individually to a mother of a child from a non-methamphetamine-producing home and a grandmother or an aunt of a child from a methamphetamine-producing home during the home visitation sessions. All tests were administered between summer 2004 and summer 2005. The principal investigator, a licensed psychologist, scored and analyzed the data. Data from both groups were compared using the SPSS-12 statistical package (SPSS, Inc., Chicago, Ill.). Parents of children with elevated clinical scores from both the methamphetamine-producing and non-methamphetamine-producing-home groups received feedback, and their children received appropriate referral for therapy in one of the other activities within the program. The study protocol and consent forms were approved by the institutional review board (IRB) of Tennessee Technological University. In order to participate in the study, written informed consent was obtained from these parents, signed assent forms were obtained from the children who could print their names, and oral assent was obtained from those who could not write. There was no compensation for participation in the study.

Results

Two chi-squares were conducted to assess if Age or Gender differed by Group (Meth-Producing vs Non-Producing). Results of the chi-square suggest that no significant differences exist on Age between

Table 2. Means and Standard Deviations of BASC-PRS-P Subscales and Cases Exceeding Clinical Level Cutoff by Group (Children From Meth-Producing Homes vs Non-Meth Producing Homes)

Subscale	BASC-PRS-P T-Scores Mean (SD)		ANOVA			Clinical Cases* N (%)	
	Meth	Non-Meth	F	P	H ²	Meth	Non-Meth
Hyperactivity	60.19 (11.75)	54.67 (9.57)	0.057	0.06	0.481	7 (22.5%)	3 (11%)
Aggression	65.52 (16.03)	55.37 (13.04)	0.011	0.11	0.730	13 (42%)	2 (7.4%)
Anxiety	57.16 (10.88)	55.19 (11.87)	0.44	0.51	0.008	5 (16%)	2 (7.4%)
Depression	62.77 (15.90)	55.93 (15.69)	2.71	0.10	0.046	12 (38.7%)	6 (22%)
Somatization	55.68 (13.14)	53.33 (11.95)	0.50	0.48	0.009	6 (19.3%)	3 (11%)
Atypicality	62.61 (16.60)	55.93 (13.04)	2.85	0.10	0.048	10 (32.2%)	4 (14.8%)
Withdrawal	50.97 (14.68)	48.30 (13.33)	0.520	0.47	0.009	3 (9.67%)	2 (7.4%)
Attention Problems	54.00 (15.53)	51.59 (12.30)	0.420	0.52	0.007	4 (12.9%)	1 (3.7%)
Adaptability	44.48 (10.73)	49.00 (10.08)	2.70	0.11	0.046	5 (16%)	1 (3.7%)
Social Skills	44.39 (13.80)	48.26 (16.54)	0.944	0.34	0.017	6 (19%)	3 (11%)

*T-scores > 70 on maladaptive behaviors fall in the clinical elevated range.

T-scores > 60 on maladaptive behaviors fall in the at-risk range.

T-scores < 40 on adaptive behaviors fall in the at-risk range.

methamphetamine-producing and non-methamphetamine-producing home participants, $\chi^2(1) = 1.15$, $P = .28$ and on Gender by Group, $\chi^2(1) = 1.65$, $P = .20$. Preliminary analysis (one sample Kolmogorov-Smirnov test) revealed normal distributions on all variables assessed. Results of data analysis revealed that methamphetamine-producing participants had mean scores in the at-risk range in 4 clinical scales; Hyperactivity (60.19), Aggression (65.52), Depression (62.77), and Atypicality (62.61). The non-methamphetamine-producing home group had mean scores in the normal range on all the scales assessed.

Further analyses were completed to compare the number of children in each group with caregiver/parental ratings that exceeded the clinical cutoff (ie, T-score > 70) for the 4 composite scales. According to the caregivers' ratings, 13 children in the methamphetamine-producing group (42%) had scores in the clinical range in externalizing behaviors compared to 4 children in the comparison group (14.8%). On behavior symptoms index scores, more children from the methamphetamine-producing homes (35.5%) were in the clinical range than children from the non-methamphetamine homes (7.4%). And on internalizing index scores, 9 children in the methamphetamine-producing group (30%) compared to 6 children in the comparison group (22%) scored in the clinical range. For the adaptive scale, 9 children from the methamphetamine-producing homes (30%), and 3 children (11%) from the comparison group had

scores in the clinical range. Table 2 presents mean scores and the percentage of clinical cases in all the 12 subscales.

In order to address the hypothesis, a MANOVA was conducted on the Externalizing Problems (Hyperactivity and Aggression) scores, and the results suggest that a significant difference exists on Externalizing Problems by methamphetamine-producing-home group, $F(2, 55) = 3.44$, $P < .05$ ($\eta^2 = 0.11$, Power = 0.62). Univariate ANOVAs revealed a significant difference on Aggression by methamphetamine-producing-home group, $F(1, 56) = 6.86$, $P < .01$ ($\eta^2 = 0.11$, Power = 0.73). Methamphetamine-producing-home participants ($M = 65.52$, $SD = 16.03$) scored significantly higher on Aggression compared to the non-methamphetamine participants ($M = 55.37$, $SD = 13.04$). No significant differences were revealed between methamphetamine-producing-home ($M = 60.19$, $SD = 11.75$) and non-methamphetamine ($M = 54.67$, $SD = 9.57$) participants on Hyperactivity. For the Internalizing Problems, there was no significant group difference, $F(3, 54) = 0.97$, ns ($\eta^2 = 0.05$, Power = 0.25).

Discussion

According to the data, the rate of behavior problems measured by the BASC-PRS-P are up to 3 times higher for children in the methamphetamine-producing-home group than for those in the comparison group. Nearly 42% of children from the methamphetamine-producing homes evidenced

clinically significant externalizing (acting out) behavior problems. This finding is consistent with Ostler and colleagues, who reported that 48% of school-aged children from meth-involved families evidenced externalizing problems. Our data also indicate mean scores in the at-risk range for depression and atypical behaviors. These findings provide an answer to the research question that these children are vulnerable to mental health problems.

A closer look at the findings reveals a significant difference in the externalizing behaviors between the children who lived in methamphetamine homes and their peers who lived in non-methamphetamine homes. For this sample, the children from methamphetamine homes appear to be particularly vulnerable to aggressive behaviors. This finding supports the first hypothesis and corroborates previous findings that have reported increased aggression and delinquent behaviors in children who live in drug environments.^{3,5,6} For example, 42% of our sample and 43% of Ostler's sample evidenced aggressive behavior problems. The social learning theory provides ample evidence that children model behaviors they observe, and this may offer a plausible explanation for this finding. This theory asserts that children are at greater risk for modeling aggressive behaviors when they are exposed to violence.²¹ The children in this sample could be modeling the violent episodes that are often associated with the meth environment.^{3,9,12,13} Although the children were no longer living in the meth homes when the study was conducted, the time away from that environment might not have erased the memories of the violence they observed. As mentioned in the motivation for the study, preschoolers in this population are more vulnerable than their older siblings. Children who witnessed parental meth transactions and the attending violence may also have difficulties using negotiations to settle disagreements. Furthermore, an additional explanation for relations between parental substance use and children's conduct problem is a shared genetic vulnerability to conduct problems.

These findings should be put in perspective, as there are usually many confounding issues relevant to this population. To the extent that out-of-home placement is a confounding factor, it is possible that being removed from their homes was most likely a traumatic intervening event that could have produced this outcome rather than the methamphetamine environment. It is also possible that the aggression outcome reflected more troubled home factors, which contributed to parents' involvement with meth in the first place.

As for emotional adjustment, the data suggest that preschoolers from methamphetamine homes are no more at risk for overall internalizing behaviors than their peers from non-methamphetamine homes. This finding is contrary to the study's prediction and to findings from other studies that children are at greater risk for developing emotional problems when certain factors such as neglect, trauma, and exposure to violence occur in their lives or environments.^{5,6,9} For this sample, it is possible that being cared for by familiar relatives, after removal from the methamphetamine home, minimized experiences of significant trauma evidenced in Haight and colleagues' studies. In accordance with research on kinship placement, caregivers within a family network may be a protective factor because they live in an environment already familiar to the children and represent fewer changes in the routines for the children.²² It is also plausible that the magnitude of the difference between the 2 groups on internalizing behavior was too small to reach statistical significance given the sample size. It is important to note that both groups in this sample appear at risk for internalizing behavior problems. As can be seen in the analysis, the lack of difference between the groups on internalizing behaviors appears to stem from the high rate of problems in the comparison group (22% in the clinical range). The BASC-PRS-P scores are not normalized. A T-score of 70, the cutoff for the clinical range, is in the 96 percentile rank on this scale. This appears to reflect a higher than expected rate of problems in the comparison sample.

Limitations

These are preliminary data of a relatively small sample for which recommendations and suggestions may be premature. Specifically, the findings are based on data collected on 2 groups of children receiving community-based social services in a rural Tennessee county. Although the study county's characteristics are comparable to those of other rural counties in this region of the state, characteristics may vary across other regions of the country. An important limitation of this study is that the authors could not reliably confirm that participants with prenatal exposure were excluded and this could have biased the results. Closely related is the fact that classification of children into the non-methamphetamine group was done through the social services program record. Misclassification could have occurred resulting in placing children from methamphetamine-producing homes in the non-methamphetamine-producing home group, thereby distorting the results. In addition, substitute

care (placement with relatives) for the methamphetamine group is a confounding factor and this can be an alternative explanation for any observed differences between the 2 groups on mental health measures. Also, relative caregivers might have underreported on the methamphetamine children's mental health assessment, making reliance on caregiver reports a study limitation. While it would have been preferable to corroborate certain information such as how long a child lived in the methamphetamine home, it was not practical to do so because of the sensitivity of the subject matter, which makes it fairly difficult to sample this population. In light of these limitations, findings from this study warrant replication with a larger multi-site study. The authors also suggest methodological improvements that could better isolate the effects of parental meth use versus production, and whether the length of time out of the methamphetamine home predicts scores within the methamphetamine group.

Conclusion

Although children from the methamphetamine group in this study did not live in optimal drug-free homes, the data suggest that a majority of them are not succumbing to significant trauma-related problems. In addition, while many of these children appear at risk, a majority of them do not. This resilience is an important result worth mentioning. In spite of these findings, a specific area of concern exists. Aggression and overall acting out behaviors found in these preschoolers may increase the risk for future behavior problems. In addition, the suggestion of vulnerability to depression should not be overlooked. There are important implications for child outcomes if these findings are replicated. A better understanding of the behavioral functioning of these children could help mental health professionals and child welfare agencies in formulating policies and developing new levels of service. It can also strengthen the argument that child welfare personnel add psychological screening to their assessment protocol when children are removed from methamphetamine homes.

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